



Forest Insect & Disease Management

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PROJECTED IMPACT OF SOUTHERN PINE BEETLE INFESTATIONS WITHIN THE
PROPOSED PERSIMMON MOUNTAIN WILDERNESS AREA (ANDREW PICKENS
RANGER DISTRICT, SUMTER NATIONAL FOREST)

SC.

by

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ABSTRACT

Southern pine beetle infestations in the proposed Persimmon Mountain Wilderness Area will have killed an estimated 217,530 CF of timber by October 1, 1980. Estimated gross value of this volume is \$36,325. Because of environmental conditions adverse to the beetle population, infestation severity is expected to decline significantly in 1981.

INTRODUCTION

The Persimmon Mountain Wilderness Area (figure 1) consists of a collage of existing and proposed wilderness in extreme northwestern South Carolina (figure 2). For over a year, this segment of the Andrew Pickens Unit of the Sumter National Forest has been the scene of heavy losses to southern pine beetle. In July of 1980, Forest Pest Management personnel made a biological evaluation of these infestations and proposed five alternatives on how they could be managed (Hoffard and others, 1980) (figure 3). In mid-September we again ground checked the area to update the status of the infestations and to project timber losses to the beetle.

Forest Pest Management's Doraville Field Office, in cooperation with the Sumter National Forest, has been monitoring spot growth throughout much of the Andrew Pickens Unit for over 2½ months. Four of the survey spots fall within the proposed wilderness area and provide an opportunity to witness spot growth trends and timber losses.

**SOUTHEASTERN AREA, STATE & PRIVATE FORESTRY
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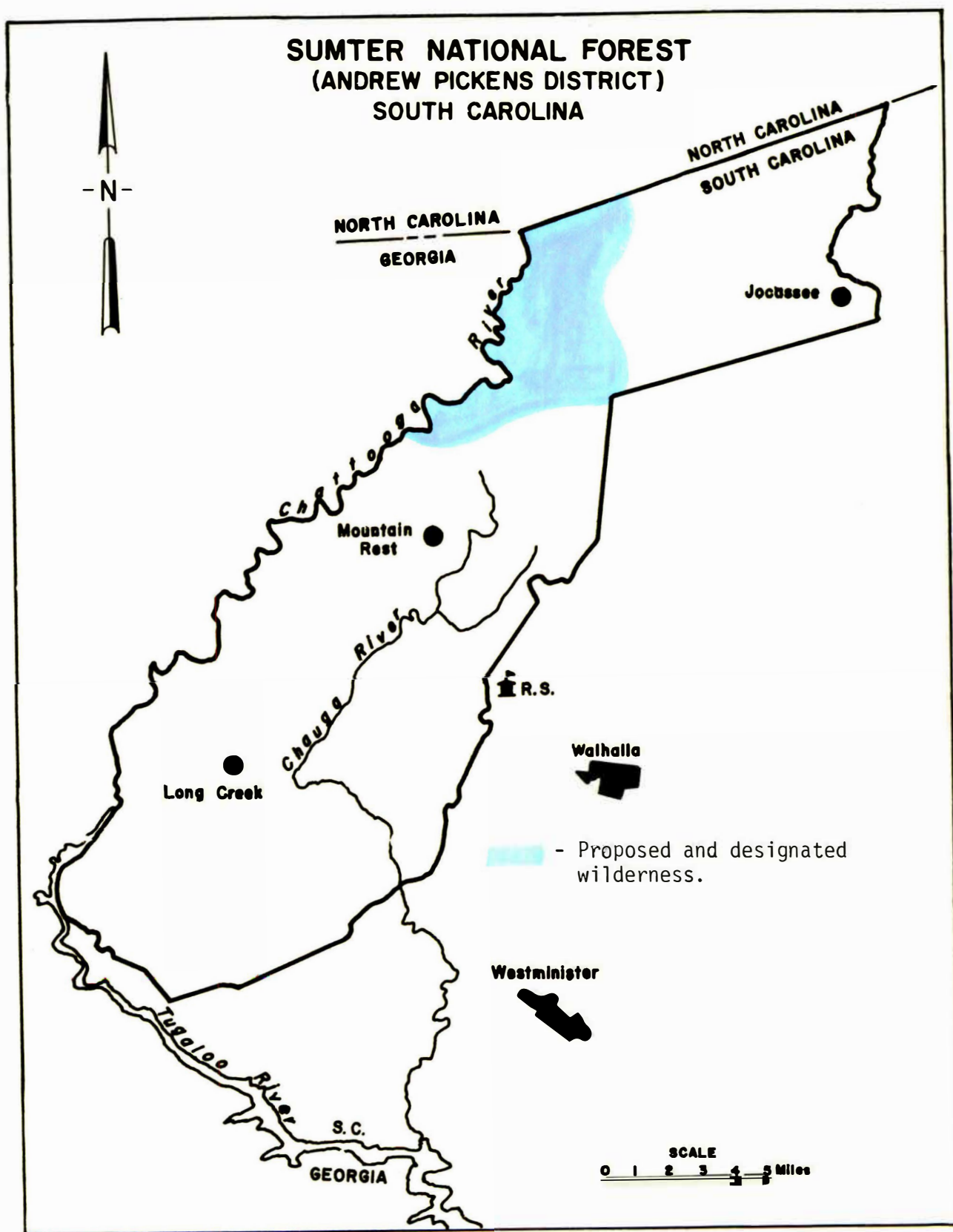


Figure 1.--Location of proposed and designated wilderness on the Andrew Pickens District.

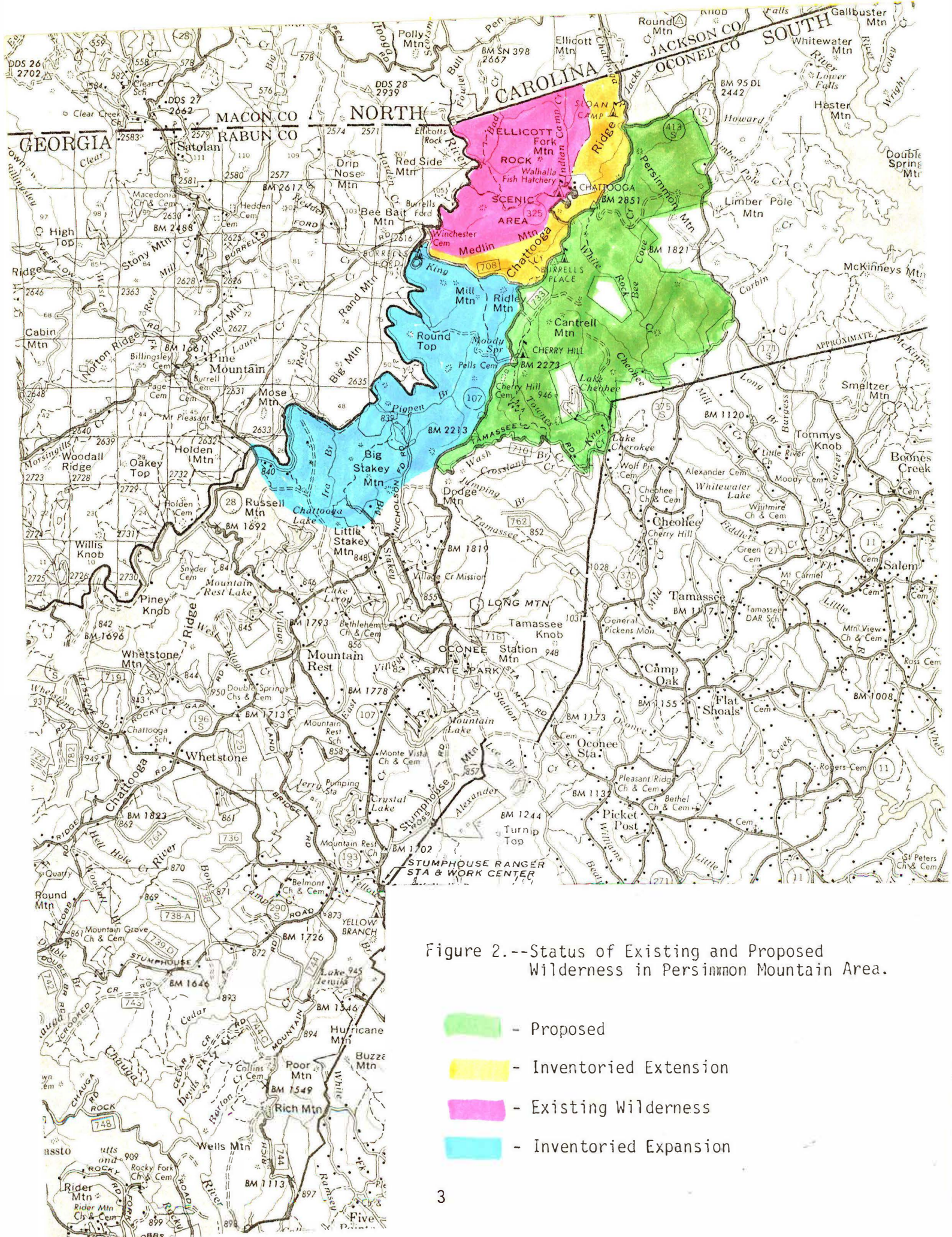


Figure 2.--Status of Existing and Proposed Wilderness in Persimmon Mountain Area.

- Proposed
- Inventoried Extension
- Existing Wilderness
- Inventoried Expansion

METHODS

1. Projection of spot growth and estimation of volume loss.

During the weeks of July 6th and 17th, the Doraville Field Office's Aerial Survey Team photographed 30 areas of dead and dying pine within the proposed wilderness area at a scale of 1:6000. The following week, five areas were ground checked to determine the condition of brood beetles and to determine the number of green infested trees (to establish ground-truth correlation).

After spot sizes were recalculated using the corrective factors, spot growth trends for each of the 30 spots within the proposed wilderness area were made through use of a computerized spot growth model developed by the Texas Forest Service. Because this model presupposes unlimited host type and no competition between combining spots, predicted losses were reduced in response to the estimated frequency of these conditions in the area. The projected losses for each spot were compared to the four spots within the wilderness area which have been monitored at three week intervals since early July. During visits to these spots during the week of September 15th, trees were measured and their condition (green infested, red, or needleless) and class (pulp-sized or sawtimber-sized) noted. Average volumes of the trees as well as the proportions in different conditions and classes were projected to estimate losses for early October, 1980.

2. Projection of value of the killed timber.

Because of differences in fiber quality due to length of time since tree death, different prices are paid for green (freshly attacked), red-needled (older), and needleless (oldest) timber (table 1.)

Based on advertised stumpage prices provided by the Andrew Pickens Unit, dollar values were assigned to the projected volume loss. In projecting economic impact, the following procedures and assumptions were used:

- a. Only the value of the killed timber is figured. Value of timber which would be taken in buffer strips has not been calculated.
- b. Although technically salvageable, old needleless trees are assigned no value because current market conditions do not permit their removal (Sinclair, 1979). ^{1/}
- c. All salvageable sawtimber-sized trees would be sold as sawtimber. All other trees meeting minimum pulpwood standards would be sold as pulp.

^{1/} Personal communication with Andrew Pickens Unit foresters.

Table 1.--Advertised prices for beetle-attacked trees by condition and class (prices are current as of September 12, 1980 for Andrew Pickens Unit).

	<u>Needleless</u>	<u>Red-neededled</u>	<u>Green</u> ^{2/}
Pulpwood (CCF)	-0-	\$1.50	\$4.00
Sawtimber (MBF)	-0-	\$26.00	\$70.00

2/ Includes freshly-attacked.

d. Only the economic impact on timber values has been estimated. Impact on non-fiber uses (e.g., recreation) has not been figured.

e. Only gross value of the timber has been estimated. Net value after figuring cost of ground checking, marking, and administrative overhead has not been calculated.

3. Projection of southern pine beetle activity into 1981

Because of the strong influences of difficult-to-predict winter factors, quantitative projection of losses to southern pine beetle in 1981 would be highly speculative. Nonetheless, during the September ground checks, condition of brood beetles, relative abundance of predators and parasites, and abundance of remaining host type were noted. The collective impact of these conditions was considered in predicting population trends for 1981.

RESULTS

1. Projection of spot growth and volume loss.

Table 2 shows projected tree losses for each of the 30 spots. When combined, these figures were reduced by 25 percent to account for the influence of host type depletion and interspot competition.

Figure 4 shows estimated losses in hundred cubic feet effective the first weeks of July, August, September, and October. Over 1800 CCF is expected to be lost. Figure 5 shows breakdown of timber by size and condition respectively.

Comparison of model-projected trends to the actual losses in the four study spots were roughly comparable.

2. Projection of economic impact.

Figure 6 shows value of salable timber by class and condition projected to October, 1981. Because of the high value of green sawtimber and low value of pulpwood from red-topped trees, these values take on greatly increased and decreased significance respectively relative to their corresponding volumes.

Totaled, an estimated \$36,325 worth of timber will have been lost in the wilderness area.

***** DAYS AFTER DETECTION *****							
SPOT	0	30	60	90	120	150	180
1	55	44	33	24	15	7	1 ACTIVE TREES
	0	45	80	107	127	139	145 EMERGED TREES
	55	88	114	131	142	147	147 SPOT SIZE
2	27	16	7	1	0	0	0 ACTIVE TREES
	0	22	35	41	42	43	43 EMERGED TREES
	27	38	43	43	43	43	43 SPOT SIZE
3	27	18	10	2	0	0	0 ACTIVE TREES
	0	22	37	45	47	47	47 EMERGED TREES
	27	40	47	47	47	47	47 SPOT SIZE
4	27	16	7	1	0	0	0 ACTIVE TREES
	0	22	35	41	42	43	43 EMERGED TREES
	27	38	43	43	43	43	43 SPOT SIZE
5	14	6	1	0	0	0	0 ACTIVE TREES
	0	11	16	17	18	18	18 EMERGED TREES
	14	18	18	18	18	18	18 SPOT SIZE
6	3	1	0	0	0	0	0 ACTIVE TREES
	0	2	3	3	3	3	3 EMERGED TREES
	3	3	3	3	3	3	3 SPOT SIZE
7	5	1	0	0	0	0	0 ACTIVE TREES
	0	4	5	5	5	5	5 EMERGED TREES
	5	5	5	5	5	5	5 SPOT SIZE
8	50	36	24	14	5	1	0 ACTIVE TREES
	0	41	70	90	101	106	106 EMERGED TREES
	50	77	94	104	107	107	107 SPOT SIZE
9	14	6	1	0	0	0	0 ACTIVE TREES
	0	11	16	17	18	18	18 EMERGED TREES
	14	18	18	18	18	18	18 SPOT SIZE
10	14	5	1	0	0	0	0 ACTIVE TREES
	0	11	16	17	17	17	17 EMERGED TREES
	14	17	17	17	17	17	17 SPOT SIZE
11	14	6	1	0	0	0	0 ACTIVE TREES
	0	11	16	17	18	18	18 EMERGED TREES
	14	18	18	18	18	18	18 SPOT SIZE

Table 2.--Model-projected losses for
30 southern pine beetle spots
in the proposed Persimmon
Mountain Wilderness Area.
(0=July 7, 1980).

12	82	64	48	34	23	13	4	ACTIVE TREES
	0	66	118	157	184	203	213	EMERGED TREES
	82	130	166	191	207	216	217	SPOT SIZE
13	5	1	0	0	0	0	0	ACTIVE TREES
	0	4	5	5	5	5	5	EMERGED TREES
	5	5	5	5	5	5	5	SPOT SIZE
14	8	2	0	0	0	0	0	ACTIVE TREES
	0	6	8	8	8	8	8	EMERGED TREES
	8	8	8	8	8	8	8	SPOT SIZE
15	5	1	0	0	0	0	0	ACTIVE TREES
	0	4	5	5	5	5	5	EMERGED TREES
	5	5	5	5	5	5	5	SPOT SIZE
16	431	362	303	253	210	173	141	ACTIVE TREES
	0	349	643	889	1094	1264	1405	EMERGED TREES
	431	712	946	1142	1304	1437	1546	SPOT SIZE
17	66	54	43	33	23	15	7	ACTIVE TREES
	0	54	97	132	158	177	189	EMERGED TREES
	66	107	140	164	181	192	196	SPOT SIZE
18	129	104	82	64	48	34	23	ACTIVE TREES
	0	105	189	255	307	346	374	EMERGED TREES
	129	208	271	319	355	380	396	SPOT SIZE
19	412	371	333	299	267	238	212	ACTIVE TREES
	0	334	635	905	1147	1364	1557	EMERGED TREES
	412	705	968	1204	1414	1602	1769	SPOT SIZE
20	2822	2408	2054	1752	1492	1270	1081	ACTIVE TREES
	0	2288	4241	5907	7327	8537	9567	EMERGED TREES
	2822	4697	6295	7658	8819	9807	10648	SPOT SIZE
21	165	145	126	109	93	79	65	ACTIVE TREES
	0	134	251	353	441	517	580	EMERGED TREES
	165	278	377	462	534	595	646	SPOT SIZE
22	107	85	66	50	36	24	14	ACTIVE TREES
	0	87	156	209	250	279	299	EMERGED TREES
	107	172	222	259	286	303	313	SPOT SIZE
23	44	34	24	16	8	1	0	ACTIVE TREES
	0	36	63	83	95	101	103	EMERGED TREES
	44	69	87	98	103	103	103	SPOT SIZE

FIGURE 4.

PROJECTED CUMULATIVE VOLUME LOSS TO SOUTHERN
PINE BEETLE JULY–OCTOBER, 1980

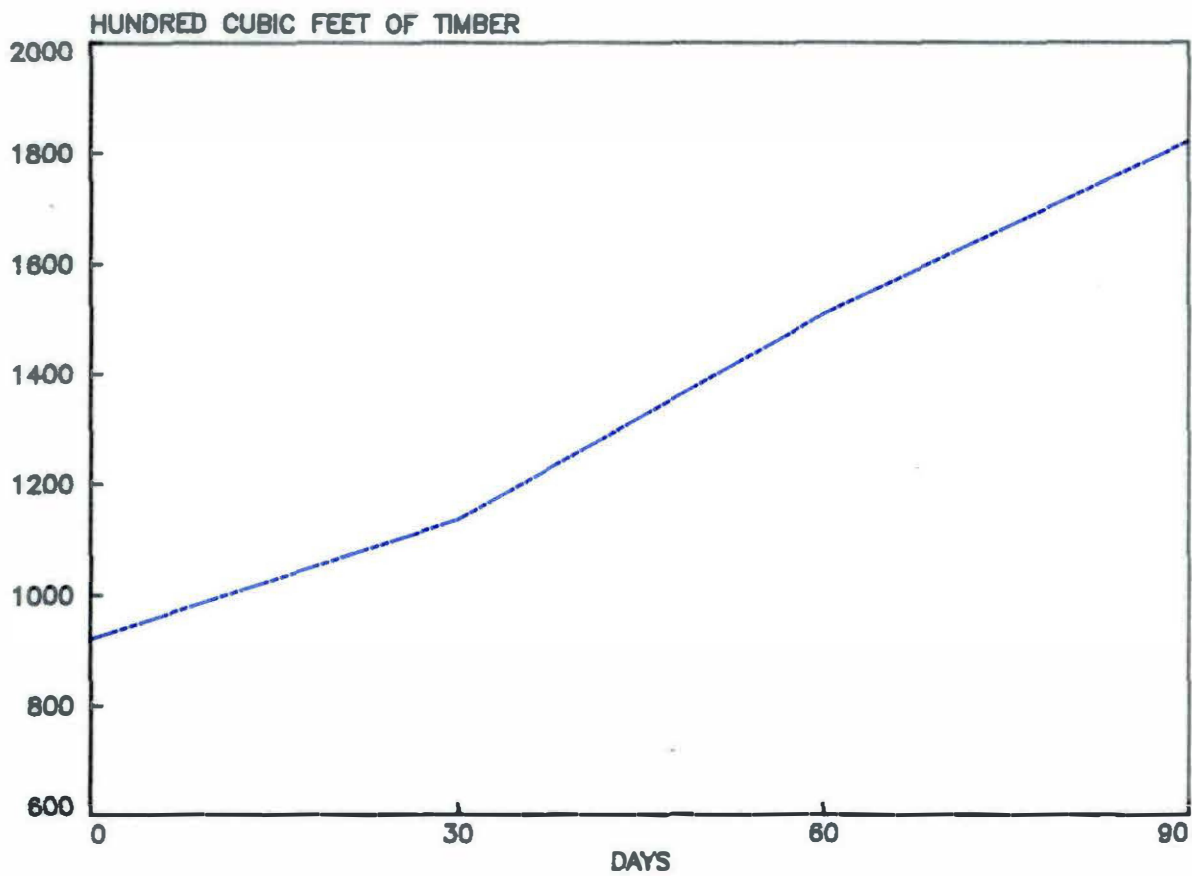
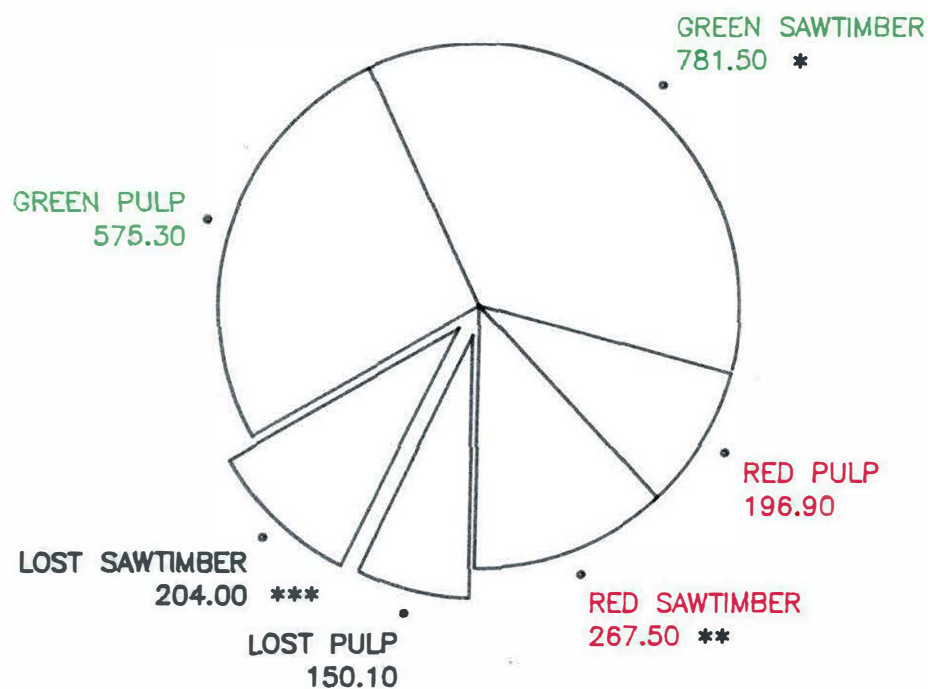


FIGURE 5.

PROJECTED VOLUME KILLED BY SOUTHERN PINE BEETLE
BY TIMBER CLASS AND CONDITION JULY–OCTOBER, 1980

(HUNDRED CUBIC FEET)



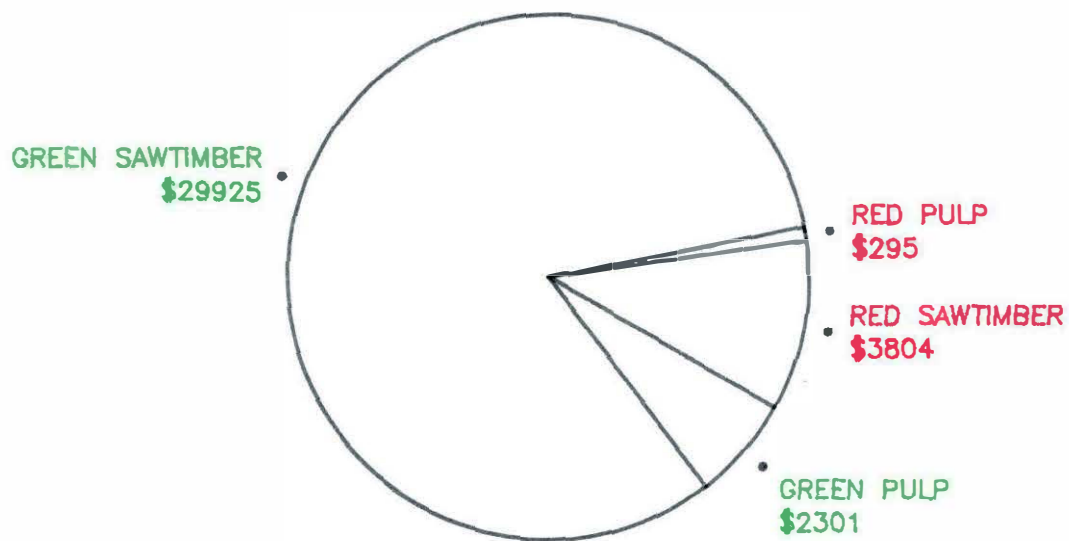
* 427.5 MBF

** 146.3 MBF

*** 111.6 MBF

FIGURE 6.

PROJECTED VALUE OF SALABLE SOUTHERN PINE BEETLE-
KILLED TIMBER BY CLASS AND CONDITION
JULY-OCTOBER, 1980



3. Projection of southern pine beetle activity into 1981.

During the September ground checks, brood beetle condition was mixed, but seemed poorer in larger spots. Predator populations seemed average, but parasitic wasp populations were extremely high. *Perhaps the most important factor affecting 1981 beetle populations in the wilderness area is the amount of remaining host type.* Some of the spots have already reached the limits of expansion because of pine type depletion, and many others are sure to do so. Other spots have grown together so that active heads of the infestations have reached previously killed trees.

Enough pine type remains in the wilderness area to sustain beetle populations next year, but high parasitism rates and a marked reduction in host material foreshadows a significant drop in activity.

REFERENCES

- Hoffard, William H., William A. Carothers, and E. T. Wilson. 1980. Biological Evaluation of Southern Pine Beetle Infestations within the Proposed Persimmon Mountain Wilderness Area. USDA, FS, FPM Report 80-1-21.
- Sinclair, Steven A. 1979. A Mill Operator's Guide to Profit on Beetle-killed Southern Pine. USDA, Ag. Handbook No. 555.